

REMARKS

In the Office Action, the Examiner objected to claim 6 because of informalities. The Examiner further rejected claims 1-8, 10, 23-27, 29 and 32 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,553,034, issued to Byers, et al. ("Byers"). The Examiner further rejected claims 18 and 19 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 5,013,150, issued to Watts, et al. ("Watts"). The Examiner further rejected claims 23, 31 and 33-36 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 3,665,201, issued to Shea, et al. ("Shea").

The Examiner also rejected claims 12-17, and 20-21 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea. The Examiner further rejected claims 9, 11, 28, and 30 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of U.S. Patent 6,836,325, issued to Maczura, et al. ("Maczura"). The Examiner further rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea, in further view of a publication entitled Principles of Instrumental Analysis, 3rd Ed. Saunders College Publishing, 1985, by Skoog ("Skoog").

In this Amendment, Applicants have amended claims 1, 5-6, 13-14, 17-18, 20, 23, 33, and 34. Applicants have also added new claims 37 and 38. However, Applicants have not canceled any claim. Accordingly, claims 1-38 will be pending after entry of this Amendment.

I. Objection to Claim 6 for Informalities

In the Office Action, the Examiner rejected claim 6 for informalities. As the Examiner assumed, claim 6 was intended to depend on claim 5, not claim 3. Applicants thank the Examiner for examining claim 6 as though it already depended on claim 5. Applicants have amended claim 6 to reflect this. This amendment is made for reasons of correcting informalities and not for reasons of patentability. Applicants do not surrender any equivalents of any amended limitations.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the objection to claim 6.

II. Rejection of Claims 1-12 under §§ 102 or 103

In the Office Action, the Examiner rejected claims 1-8 and 10 under 35 U.S.C. § 102(b) as being anticipated by Byers. The Examiner further rejected claims 9 and 11 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Maczura. The Examiner also rejected claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea. Claims 2-12 depend directly or indirectly on claim 1. Claim 1 recites a fluorometer for measuring fluorescence of a non-solid material flowing through a system of pipes. The fluorometer includes a housing with a distal end, the housing having a shape adapted to insert into the system of pipes. The fluorometer also includes a light source for passing light through the distal end towards the non-solid material, where the light source is a light emitting diode. The fluorometer has a light detection circuit for receiving, through the distal end, light emitted from the non-solid material.

Applicants respectfully submit that Byers, Shea or its combination does not disclose, teach, or even suggest such a fluorometer. Byers describes an apparatus for detecting the presence of fluorescent particles of ion exchanges resin in a water flow channel. Byers's apparatus uses a light source to make such a determination. Byers describes using a lamp as a light source. Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a fluorometer. Second, Shea's source of incident light is a light bulb. *Shea, See Figure 3.* Maczura describes an optical probe with a light source for determining physical and chemical properties of a sample by measuring the optical characteristics of its transmitted and/or reflected light. Maczura's light source is not a light emitting diode.

In contrast, claim 1 recites a fluorometer that includes a light source for passing light through the distal and towards the non-solid material, where the light source is a light emitting diode. Applicants respectfully submit that the cited references do not disclose, teach, or suggest such a light emitting diode.

Accordingly, Applicants respectfully submit that the cited references do not render claim 1 unpatentable. As claims 2-12 are dependent directly or indirectly on claim 1, Applicants respectfully submit that claims 2-12 are patentable over the cited references for at least the reasons that were discussed above in relation to claim 1.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(b) rejections of claims 1-8 and 10, and §103(a) of claims 9, 11 and 12.

III. Rejection of Claims 13-16 under § 103

In the Office Action, the Examiner rejected claims 13-16 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea. Claims 14-16 depend directly or indirectly on claim 13. Claim 13 recites an apparatus for measuring fluorescence of a non-solid material that flows through two pipes. The apparatus includes an adjoining member for connecting the first and second pipes. The adjoining member has a passageway that allows the non-solid material to flow from the first pipe to the second pipe. The adjoining member also has a chamber that on a first end is open and at a second end terminates on the passageway. The apparatus includes a fluorometer for inserting into the chamber to measure the fluorescence of the non-solid material, where the fluorometer includes a light emitting diode.

Applicants respectfully submit that the combination of Byers and Shea does not disclose, teach, or even suggest such an apparatus. As mentioned above, Byers describes an apparatus for detecting the presence of fluorescent particles of ion exchanges resin in a water flow channel. Byers's apparatus uses a light source to make such a determination. Byers describes using a lamp

as a light source. Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a fluorometer. Second, Shea's source of incident light is a light bulb. *Shea, See Figure 3*.

In contrast, claim 13 recites an apparatus that includes a fluorometer, where the fluorometer has a light emitting diode. Applicants respectfully submit that the cited references do not disclose, teach, or suggest such a light emitting diode.

Accordingly, Applicants respectfully submit that the cited references do not render claim 13 unpatentable. As claims 14-16 are dependent directly or indirectly on claim 13, Applicants respectfully submit that claims 14-16 are patentable over the cited references for at least the reasons that were discussed above in relation to claim 13.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §103(a) rejections of claims 13-16.

IV. Rejection of Claim 17 under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claim 17 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea. Claim 17 recites an apparatus for measuring fluorescence of a non-solid material. The apparatus includes two pipes through which the non-solid material flows. The apparatus also includes an adjoining member that connects the two pipes. The adjoining member has a passageway that allows non-solid material to flow from one pipe to the other. The adjoining member also has a chamber that on a first end is open and at a second end terminates on the passageway. The apparatus also includes a fluorometer inserted into the chamber for measuring the fluorescence of the non-solid material. The fluorometer and the adjoining member have corresponding threads for fastening the fluorometer and the adjoining member together.

Applicants respectfully submit that the combination of Byers and Shea does not disclose, teach, or even suggest such an apparatus. As previously described, Byers describes an apparatus for detecting the presence of fluorescent particles of ion exchanges resin in a water flow channel. Byers's apparatus uses a light source to make such a determination. As noted by the Examiner, Byers does not teach, disclose, or suggest an adjoining member. For this limitation, the Examiner cites Shea. As previously described, Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a fluorometer. Second, Shea describes an adjoining member held in place by means of flanges and bolts. *See Shea, column 2, lines 69-70*. As such, Shea describes corresponding threads that are on the nuts and bolts. Therefore, even if Shea's turbidimeter can be considered a fluorometer, the turbidimeter and adjoining member in Shea do not have corresponding threads. Instead, Shea's turbidimeter and adjoining member have flanges.

In contrast, claim 17 recites an apparatus that includes a fluorometer, where the fluorometer and the adjoining member have corresponding threads for fastening the fluorometer and the adjoining member together. Applicants respectfully submit that the cited references do not disclose, teach, or suggest such corresponding threads.

Accordingly, Applicants respectfully submit that the cited references do not render claim 17 unpatentable. In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §103(a) rejection of claims 17.

V. Rejection of Claims 18 and 19 under § 102

In the Office Action, the Examiner rejected claims 18 and 19 under 35 U.S.C. § 102(b) as being anticipated by Watts. Claim 19 depends directly on claim 18. Claim 18 recites a fluorometer for measuring fluorescence of a non-solid material. The fluorometer includes first

and second orifices on a side of the fluorometer that is to be placed next to the non-solid material. The fluorometer includes a light source for passing light through the first orifice and onto the non-solid material. The light source is a light emitting diode. The fluorometer also includes a light detection circuit for receiving, through the second orifice, light emitted from the non-solid material.

Applicants respectfully submit that Watts does not disclose, teach, or even suggest such a fluorometer. Watts describes an apparatus for detecting fluorescence or light scatter. Watts describes using a light source to make such a detection. However, Watts does not describe the light source to be a light emitting diode, as recited in claim 18.

Accordingly, Applicants respectfully submit that Watts does not render claim 18 unpatentable. As claim 19 is dependent directly on claim 18, Applicants respectfully submit that claim 19 is patentable over Watts for at least the reasons that were discussed above in relation to claim 18.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(b) rejections of claims 18 and 19.

VI. Rejection of Claims 20-22 under § 103

In the Office Action, the Examiner rejected claims 20-21 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Shea. The Examiner also rejected claim 22 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Maczura, in further view of Skoog. Claims 21 and 22 depends directly on claim 20. Claim 20 recites a method of measuring fluorescence of a non-solid material flowing through a system of pipes. The method inserts the fluorometer into an adjoining member of the pipe system that connects two pipes in the system. The method directs light from a light emitting diode in the fluorometer onto the non-solid material flowing between the two pipes. The method collects into the fluorometer the light

emitted off the non-solid material. The method generates an electrical signal that is proportional to the fluorescence of the non-solid material, based on the collected light.

Applicants respectfully submit that Byers, Shea, Maczura or its combination does not disclose, teach, or even suggest such a method. As previously mentioned, Byers describes an apparatus for detecting the presence of fluorescent particles of ion exchanges resin in a water flow channel. Byers's apparatus uses a light source to make such a determination. Byers describes using a lamp as a light source. Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a fluorometer. Second, Shea's source of incident light is a light bulb. *Shea, See Figure 3*. Maczura describes an optical probe with a light source for determining physical and chemical properties of a sample by measuring the optical characteristics of its transmitted and/or reflected light. Maczura's light source is not a light emitting diode.

In contrast, claim 20 recites a method that directs light from a light emitting diode in a fluorometer. Applicants respectfully submit that the cited references do not disclose, teach, or suggest such a light from a light emitting diode.

Accordingly, Applicants respectfully submit that the cited references do not render claim 20 unpatentable. As claims 21 and 22 are dependent directly on claim 20, Applicants respectfully submit that claims 21 and 22 are patentable over the cited references for at least the reasons that were discussed above in relation to claim 20.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §103(a) of claims 20-22.

VII. Rejection of Claims 23-32 under §§ 102 or 103

In the Office Action, the Examiner rejected claims 23-27 and 29 under 35 U.S.C.

§ 102(b) as being anticipated by Byers. The Examiner rejected claims 23 and 31 under 35 U.S.C. § 102(b) as being anticipated by Shea. The Examiner also rejected claims 28 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Byers in view of Maczura. Claims 24-32 depend directly or indirectly on claim 23. Claim 23 recites a spectrometer for measuring light from a non-solid material flowing through a system of pipes. The spectrometer includes a housing with a distal end. The housing has a shape adapted to insert into the system of pipes. The spectrometer includes a light source for passing light through the distal end towards the non-solid material. The light source is a light emitting diode. The spectrometer also includes a light detection circuit for receiving, through the distal end, light from the non-solid material.

Applicants respectfully submit that Byers, Shea, Maczura or its combination does not disclose, teach, or even suggest such a method. As previously mentioned, Byers describes an apparatus for detecting the presence of fluorescent particles of ion exchanges resin in a water flow channel. Byers's apparatus uses a light source to make such a determination. Byers describes using a lamp as a light source. Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a spectrometer. Second, Shea's source of incident light is a light bulb. *Shea, See Figure 3.* Maczura describes an optical probe with a light source for determining physical and chemical properties of a sample by measuring the optical characteristics of its transmitted and/or reflected light. Maczura's light source is not a light emitting diode.

In contrast, claim 23 recites a spectrometer that includes a light source, where the light source is a light emitting diode. Applicants respectfully submit that the cited references do not disclose, teach, or suggest such a light from a light emitting diode.

Accordingly, Applicants respectfully submit that the cited references do not render claim 23 unpatentable. As claims 24-32 are dependent directly on claim 23, Applicants respectfully submit that claims 24-32 are patentable over the cited references for at least the reasons that were discussed above in relation to claim 23.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102 (b) of claims 23-27, 29, 31-32 and the §103(a) of claims 28 and 30.

VIII. Rejection of Claims 33-36 under § 102

In the Office Action, the Examiner rejected claims 33-36 under 35 U.S.C. § 102(b) as being anticipated by Shea. Claims 34-36 depend directly or indirectly from claim 33. Claim 33 recites an apparatus for measuring light from a non-solid material that flows through two pipes. The apparatus includes an adjoining member for connecting the first and second pipes. The adjoining member has a passageway that allows the non-solid material to flow from the first pipe to the second pipe. The adjoining member also has a chamber that on a first end is open and at a second end terminates on the passageway. The apparatus includes a spectrometer for inserting into the chamber to emit light towards the non-solid material and measure light from the non-solid material. The spectrometer includes a light emitting diode.

Applicants respectfully submit that Shea does not disclose, teach, or even suggest such an apparatus. As mentioned above, Shea describes a turbidimeter for providing an indication of turbidity of a liquid solution by measuring the scattered light which is reflected back towards a source of incident light. First, a turbidimeter as described in Shea is not a spectrometer. Second, Shea's source of incident light is a light bulb. Shea, See Figure 3.

In contrast, claim 33 recites an apparatus that includes a spectrometer, where the spectrometer has a light emitting diode. Applicants respectfully submit that Shea does not disclose, teach, or suggest such a light emitting diode.

Accordingly, Applicants respectfully submit that the cited references do not render claim 33 unpatentable. As claims 34-36 are dependent directly or indirectly on claim 33, Applicants respectfully submit that claims 34-36 are patentable over Shea for at least the reasons that were discussed above in relation to claim 33.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the §102(b) rejections of claims 33-36.

IX. New Claims 37-38

In this Amendment, Applicants have added new claims 37 and 38. Applicants respectfully submit that claims 37 and 38 are fully supported by the specification. Claim 38 is dependent directly on claim 37. As claim 37 recites similar limitations as claim 1, Applicants respectfully submit that claim 37 is patentable over the cited references for at least the same reasons that were discussed above for claim 1. As claim 38 is dependent directly on claim 37, Applicants respectfully submit that claim 38 is patentable over the cited references for at least the reasons that were discussed above in relation to claim 37. Accordingly, Applicants respectfully submit that claims 37 and 38 are in condition for allowance.



CONCLUSION

In view of the foregoing, it is submitted that all pending claims, namely claims 1-38 are in condition for allowance. Reconsideration of the rejections and objections is requested. Allowance is earnestly solicited at the earliest possible date.

Respectfully submitted,

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Dated: 10/24/05

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